



OPTICAL LABORATORY

"Seeing is believing"

Compensation Technology



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1. Our Technologies: Lens Calculation
2. Surface Power: Power read by the focimeter
3. Digital Ray-Path:
 - ▶ Oblique Aberration
 - ▶ Influence on User Power
 - ▶ Visual Field Simulation
 - ▶ Power read by the focimeter
 - ▶ Double Label
 - ▶ Personalization Parameters
 - ▶ Conclusions

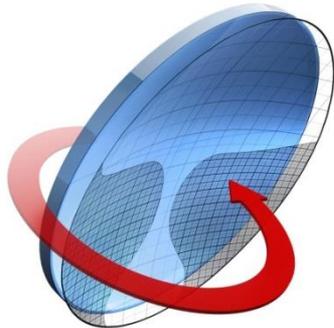
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Our Technologies: Lens Calculation

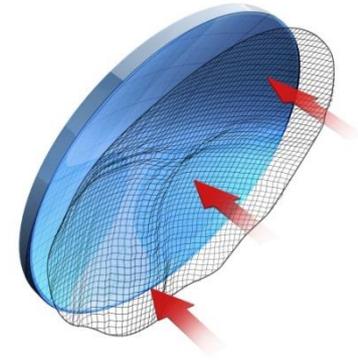
SURFACE POWER

- ▶ Like conventional lenses but produced with digital surfacing equipment
- ▶ Not personalized
- ▶ The face/frame parameters are not necessary
- ▶ Includes variable inset
- ▶ Easy to be checked with a focimeter



DIGITAL RAY-PATH

- ▶ Optimized point by point surface
- ▶ Considers all possible gaze directions
- ▶ Reduces oblique aberrations, maximizes vision quality
- ▶ Allows input of face/frame individual parameters
- ▶ Double label



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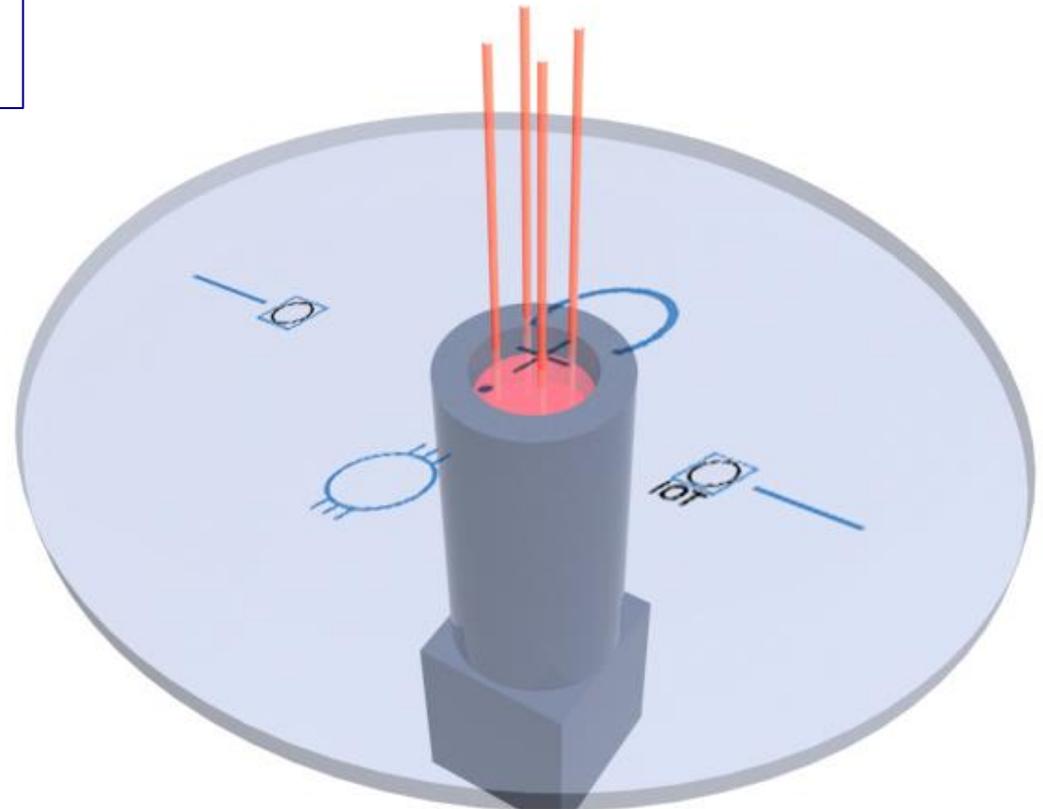
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Surface Power: Power read by the focimeter

**Prescribed power
=
Measured power**

- Like conventional lenses
- There is no power compensation
- Easy to be understood by the optical professionals

FOCIMETER MEASURING A LENS



SURFACE POWER



DIGITAL RAY-PATH

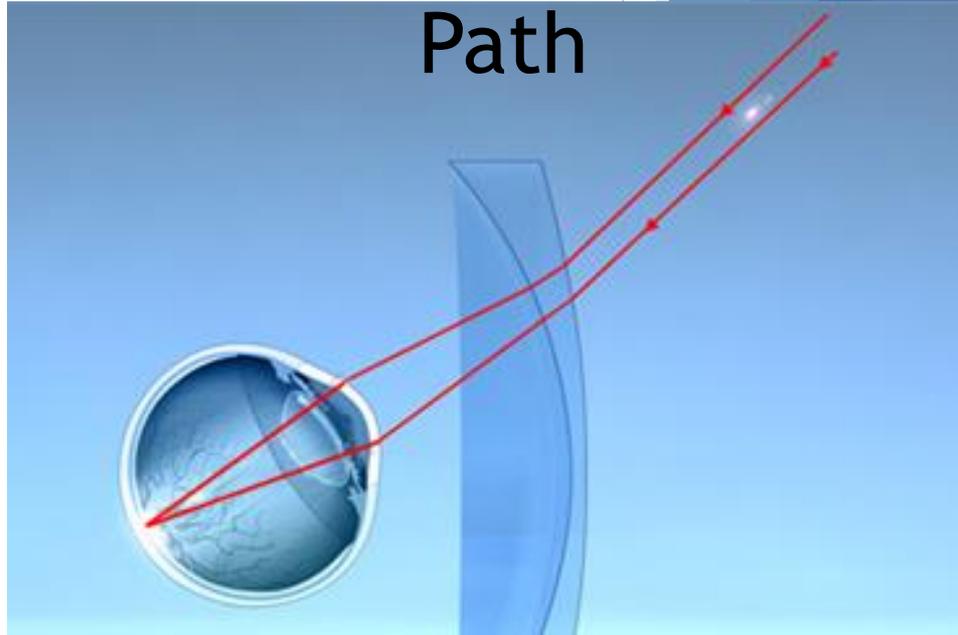
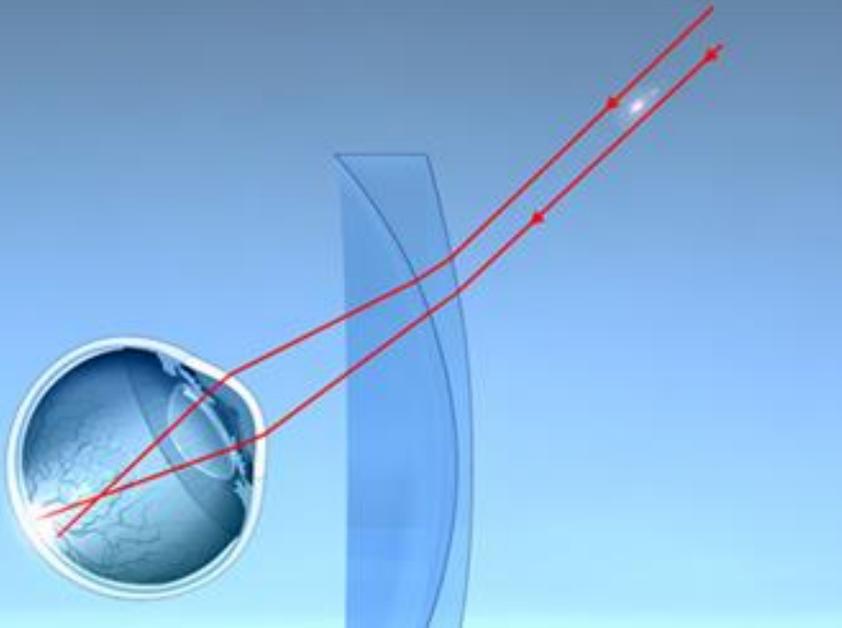
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Oblique Aberration

Conventional lens

Lens calculated
with Digital Ray-
Path



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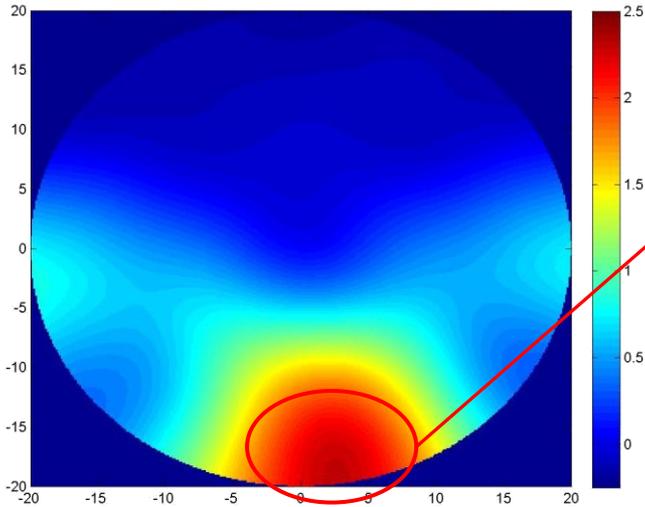
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Influence on User Power

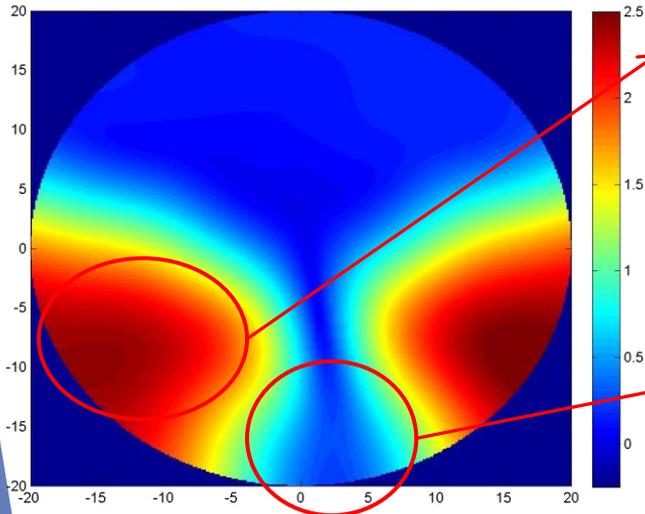
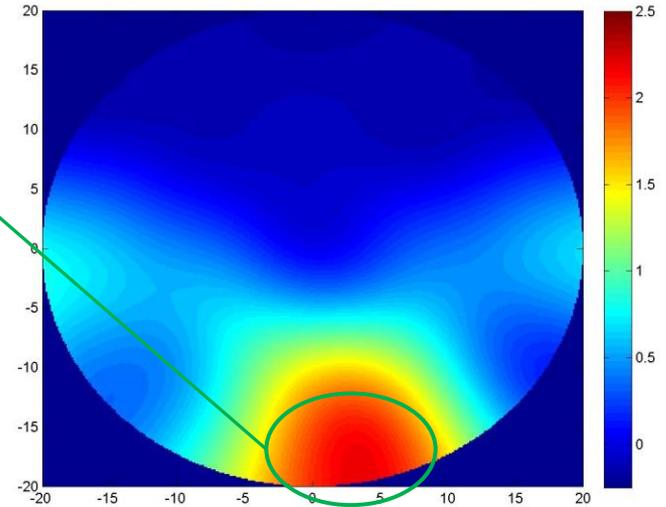
panto=0 facial=0

Conventional:
Plano ADD 200

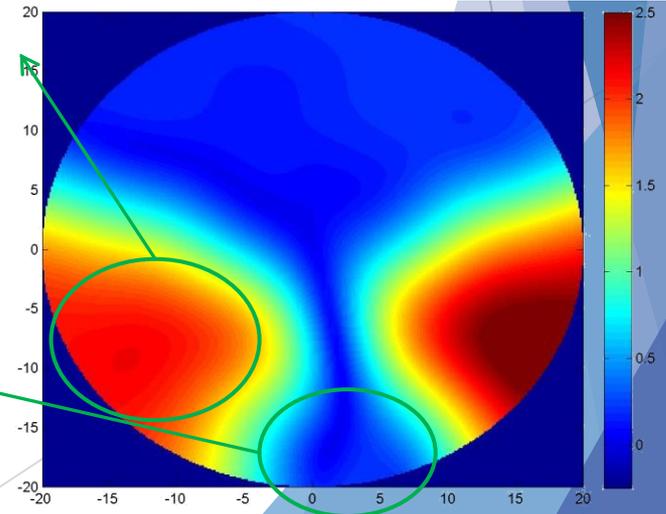
panto=12; facial=10



Small differences in the near perceived power



Considerable changes in the unwanted astigmatism



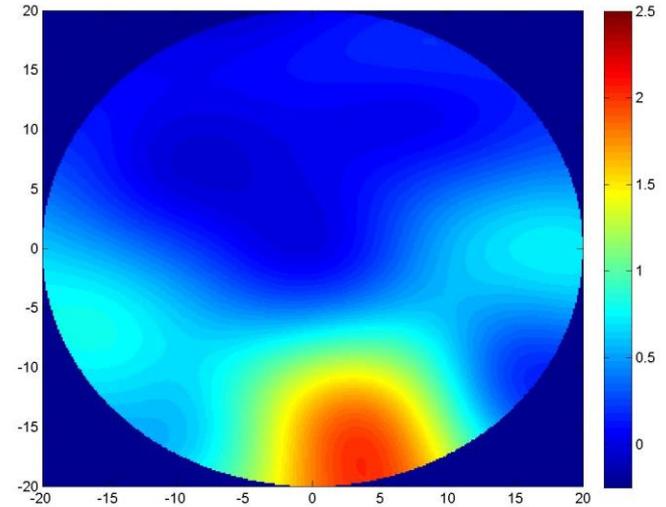
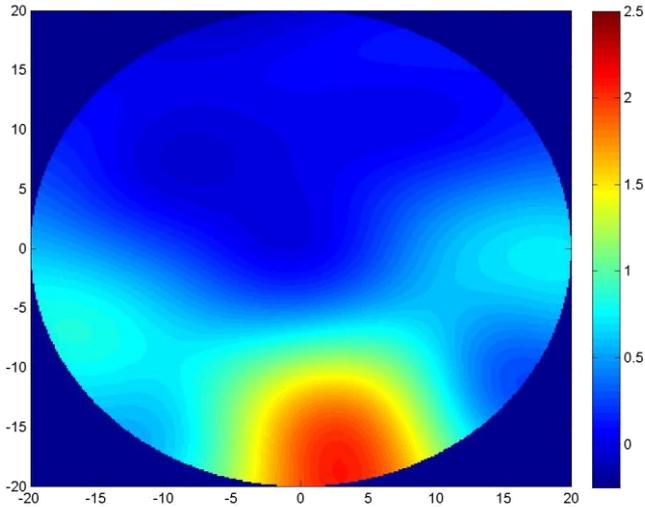
Some cylindrical component appears in the near area

Influence on User Power

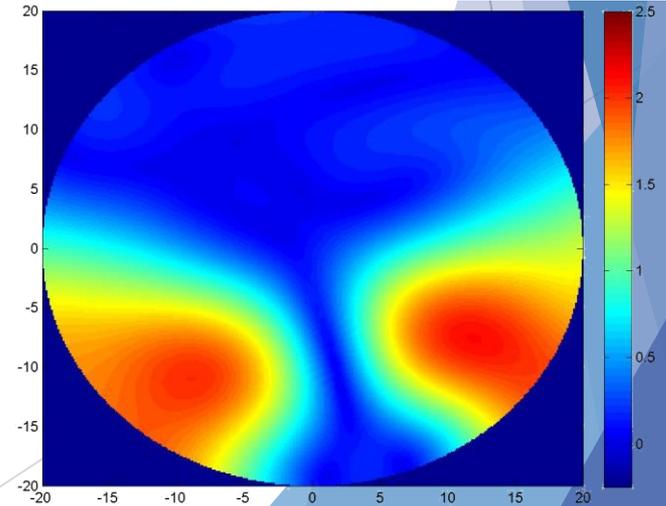
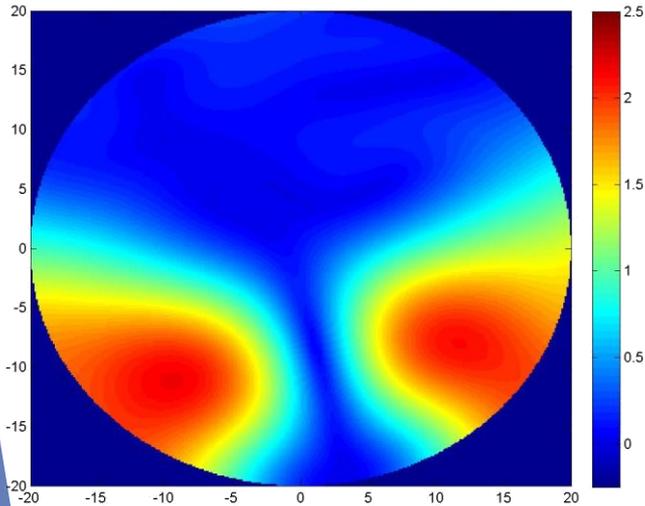
panto=0 facial=0

Alpha:
Plano ADD 2.00

panto=12 facial=10



There is barely variation

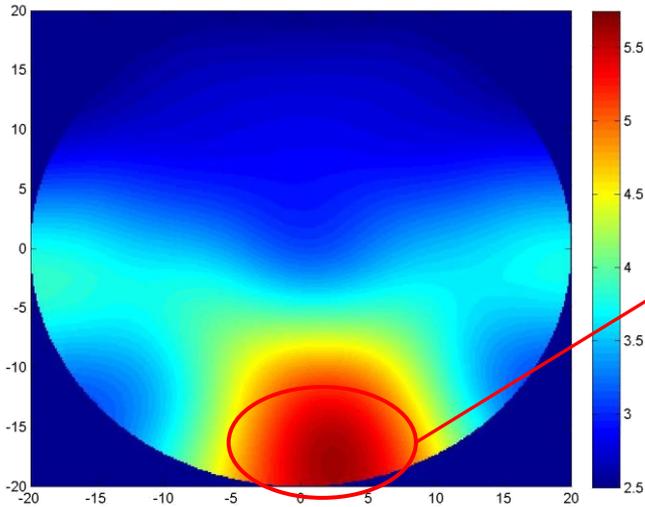


Influence on User Power

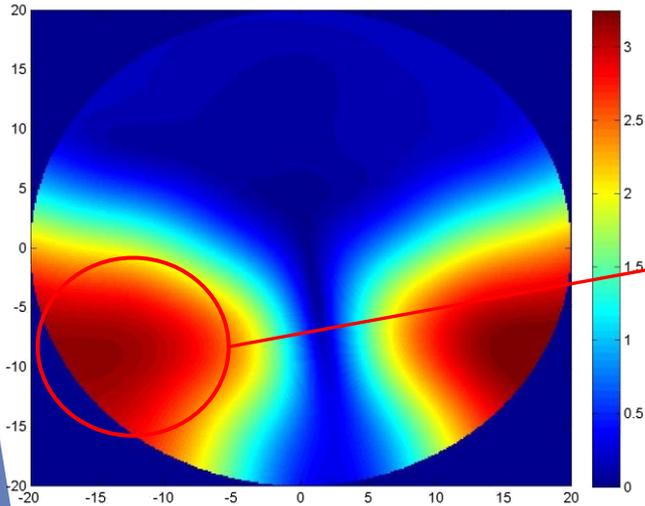
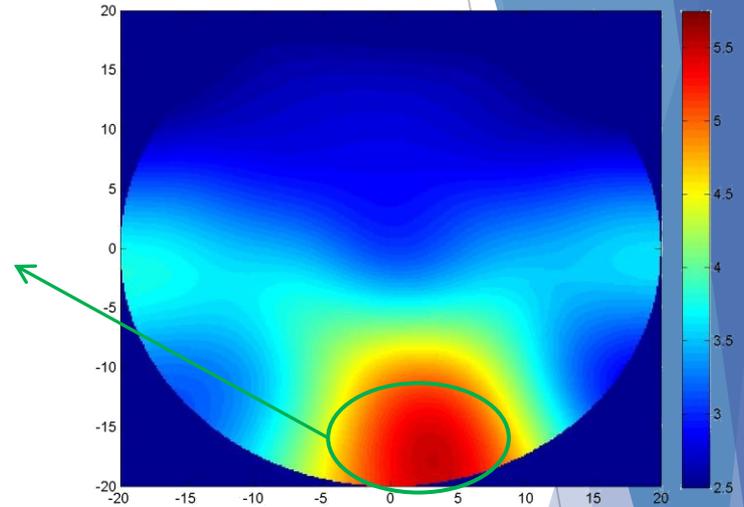
panto=0 facial=0

Conventional:
Plano+3.00 ADD 2.50

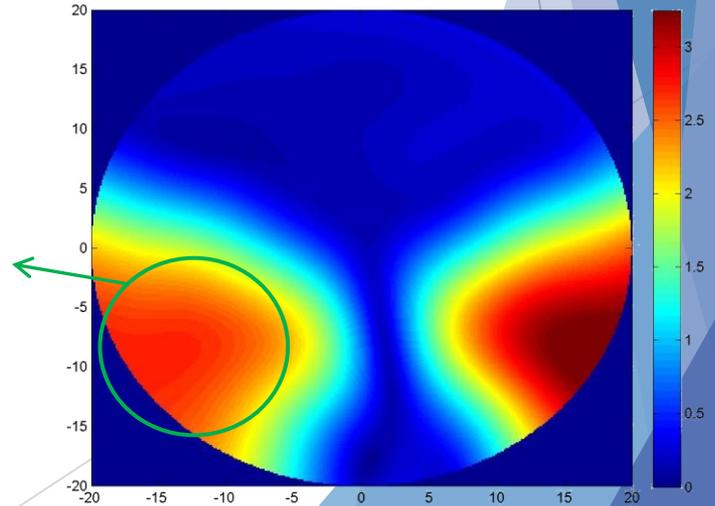
panto=12; facial=10



Near
perceived
power
changes



Lateral
unwanted
astigmatism
varies



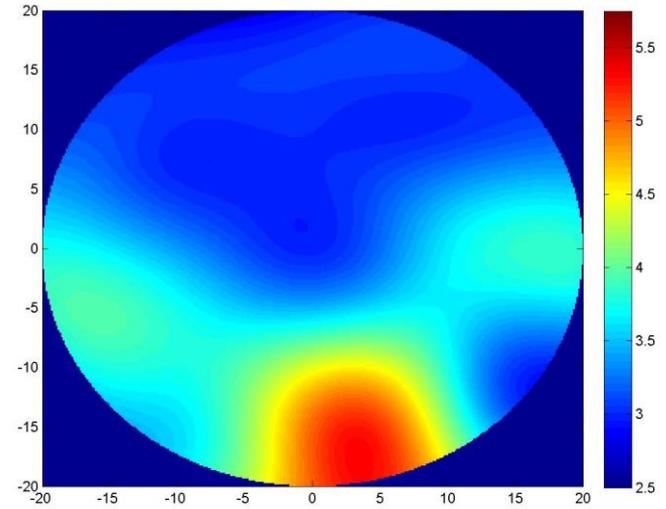
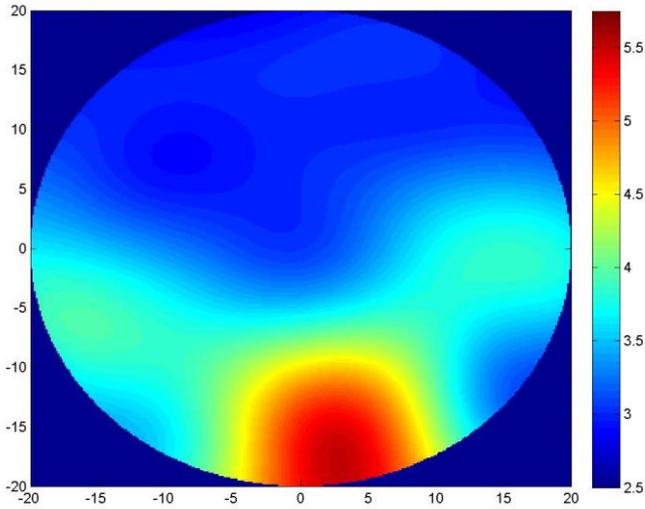
Influence on User Power

Alpha:

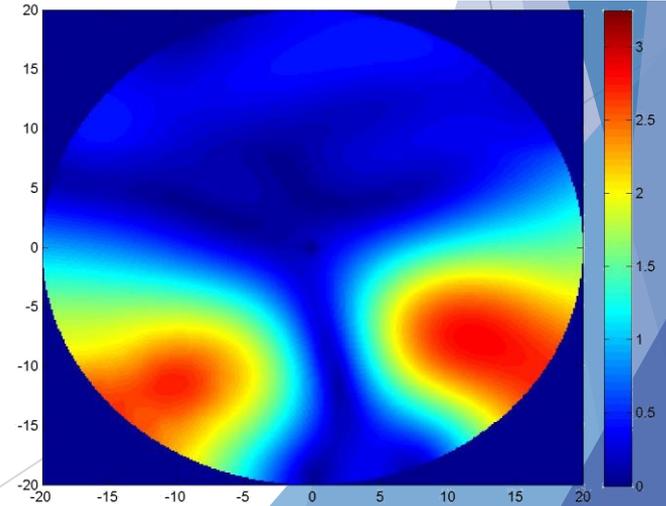
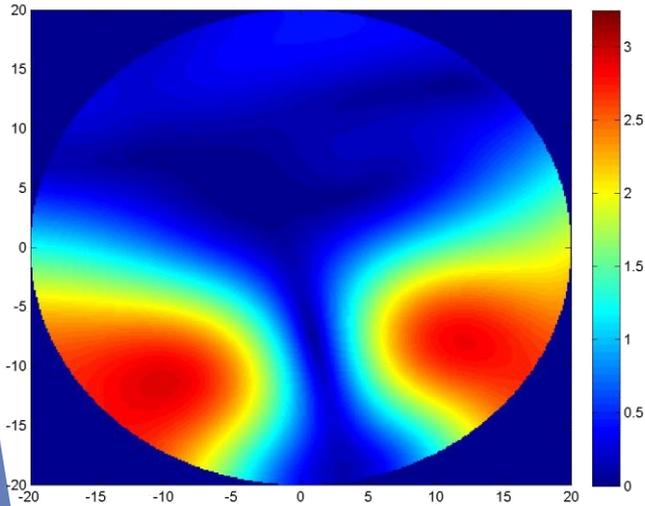
panto=0 facial=0

Plano+3.00 ADD 2.50

panto=12 facial=10



There is barely variation

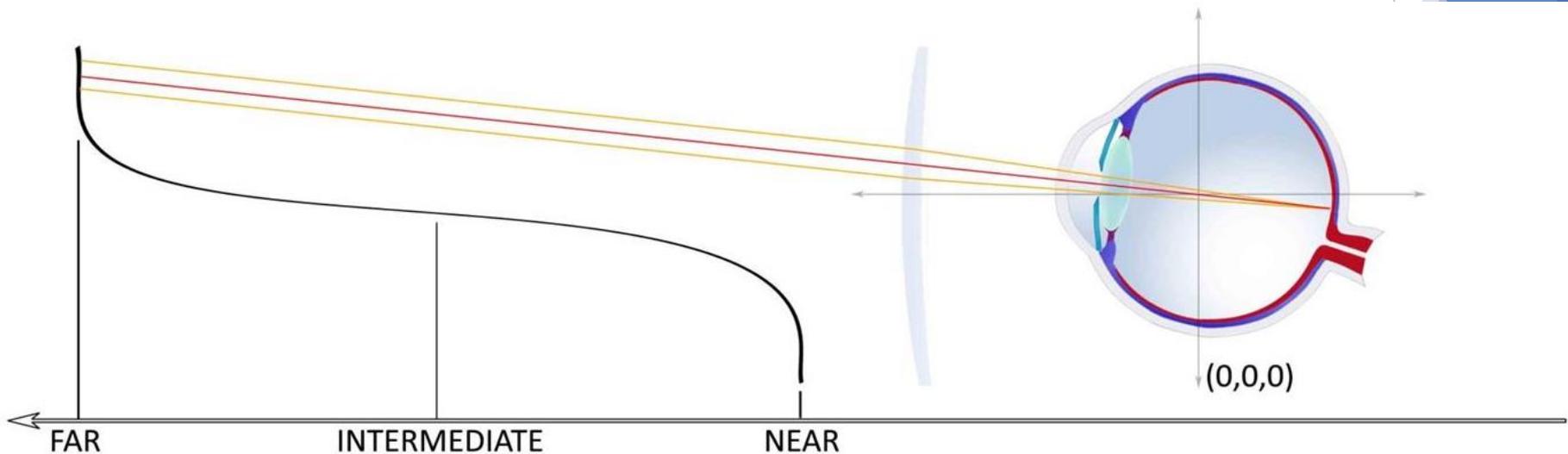


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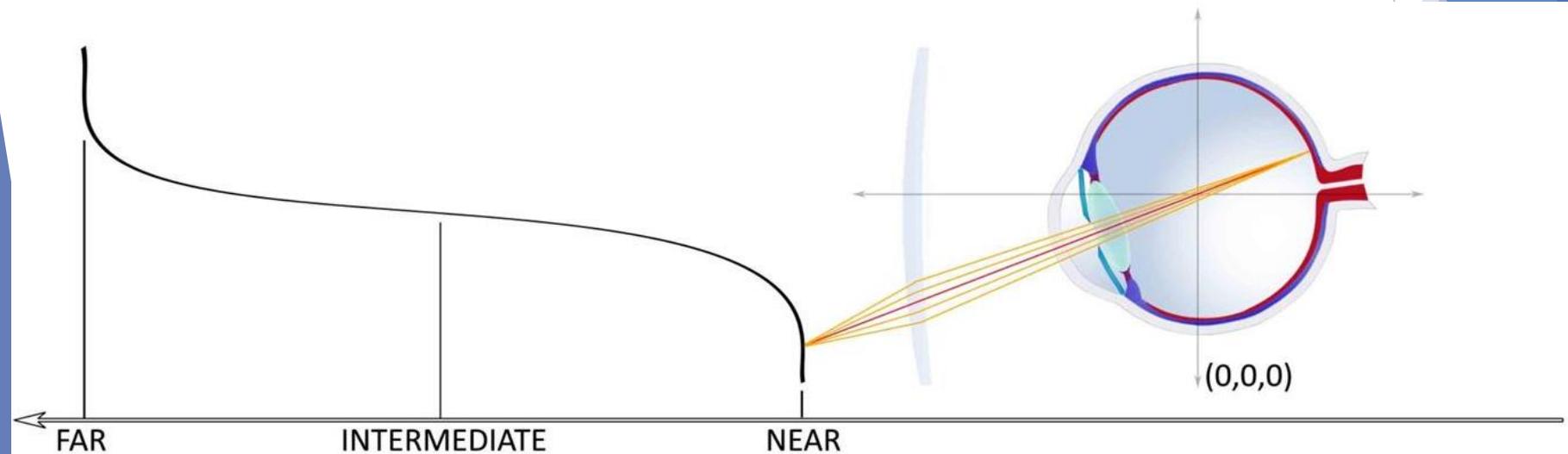
Visual field Simulation

- For Progressive lenses it is important to calculate user power with respect to the object distance
- Complete simulation of the lens-eye system, and correct user power calculation due to the object distance



Visual field Simulation

- Ray pencils for each object distance are created with the corresponding vergence

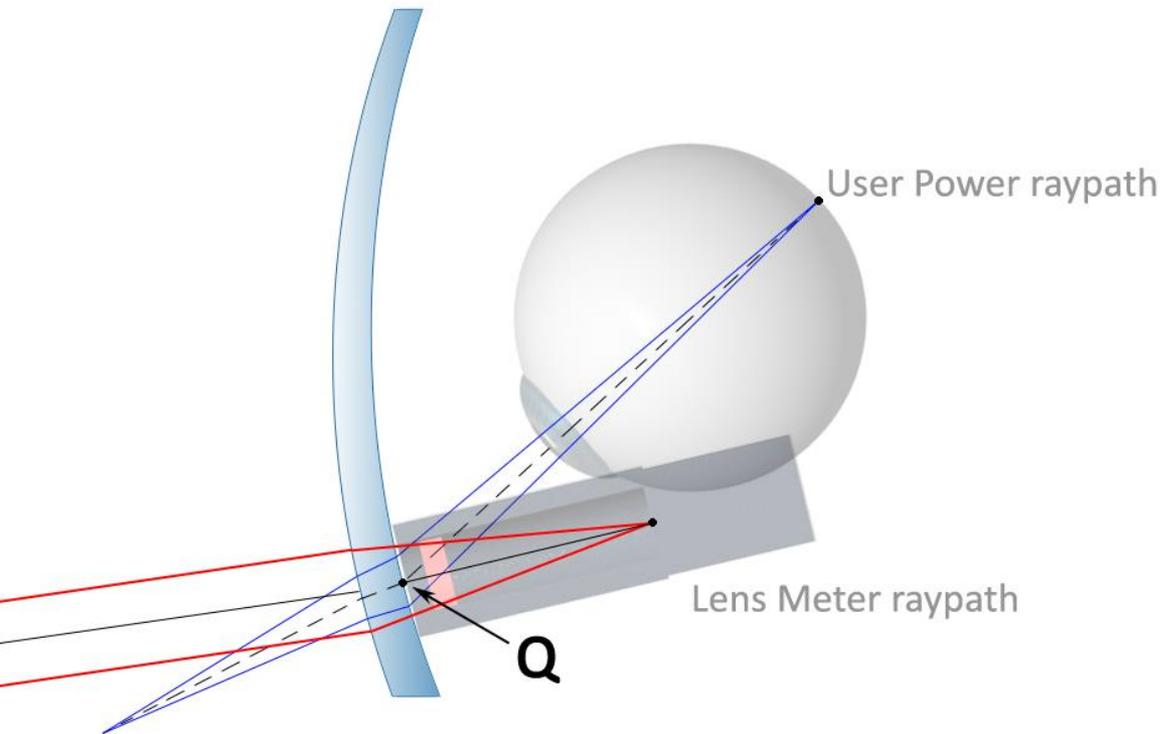


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Power read by the focimeter

Prescribed power = Perceived power



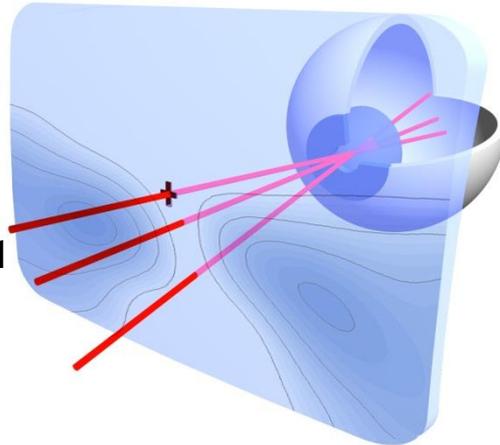
Notice that the power read by the focimeter will be different



Power read by the focimeter

Prescribed power 0,00 AD 2,00 with panto=0; wrap=0

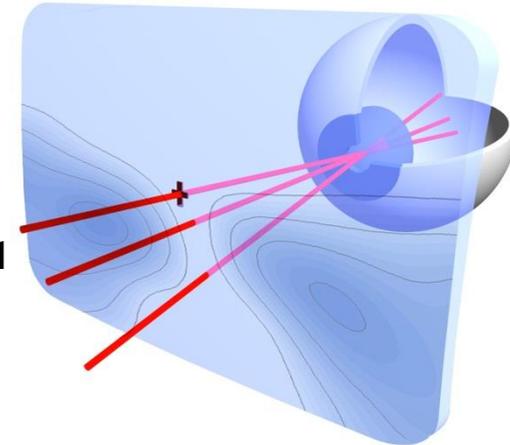
Conventional lens



Perceived power:
Far
-0,04 (-0,02) 80°
Near
+2,23 (-0,27) 172°

Measured power:
Far
0,00
Near
2,00

Digital Ray-Path lens



Perceived power:
Far
0,00
Near
2,00

Measured power:
Far
+0,03
Near
+1,87 (-0,14) 170°

The pantoscopic and wrapping angles induce a notable difference in the perceived power and unwanted astigmatism is also appearing.

That difference is corrected varying the power of the lens so that the eye receives the prescribed power. The new power of the lens will be automatically calculated by the software.

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Double label

Standard lens

Lens Brand
Standard Progressive

SPH: 3.25
CYL:1.50
AX:75
ADD:2.00

Base: 6.25 Index: 1.67

We expect this on the focimeter. The user doesn't get this at near or at far with tilts

Premium lens

Lens Brand
Ultimate Progressive

User Power

SPH: 3.25
CYL:1.50
AX:75
ADD:2.00

Base: 6.25 Index: 1.67

FOA Power

Far Point:

SPH: 3.19
CYL:1.43
AX:62

Near Point:

SPH:5.10
CYL: 1.67
AX: 58

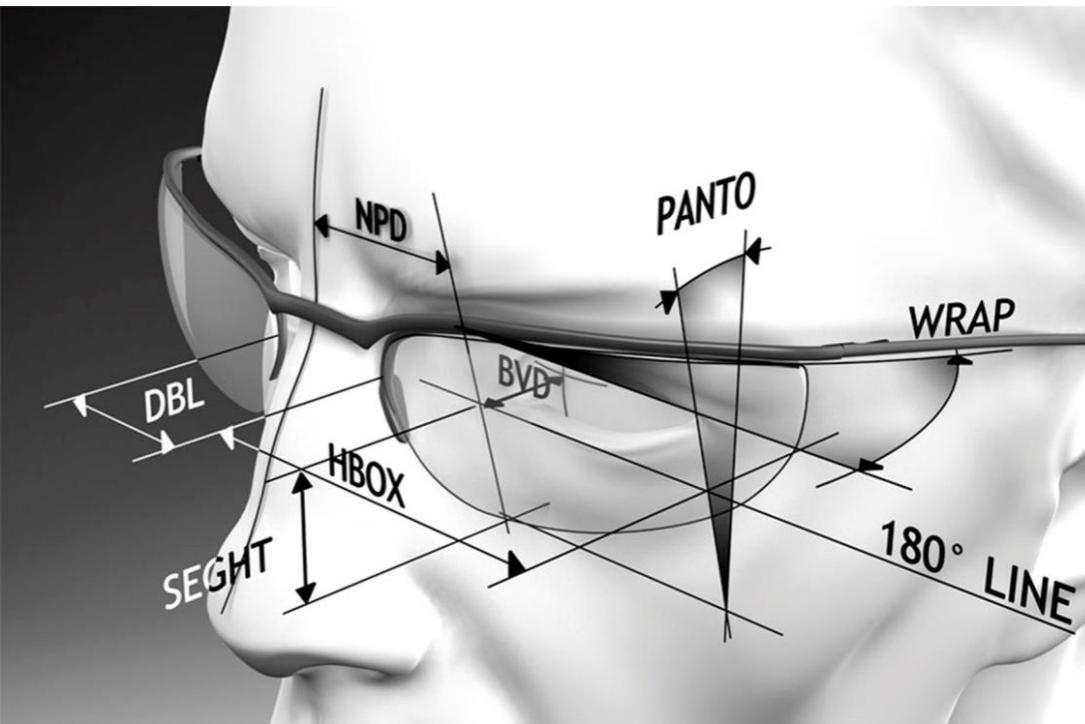
The user will get this. Vision will be as sharp as in the prescription room

This is what we will get in a FOA focimeter

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Personalization parameters



- Wrap angle (ZTILT)
- Pantoscopic angle (PANTO)
- Back Vertex Distance (BVD)
- Near Working Distance (NWD)
- Pupillary Distances (NDP, SEGHT)
- Frame Parameters (HBOX, VBOX, DBL)

Movie



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Conclusions

- ✓ Optimized point by point surface
- ✓ Considers all possible gaze directions
- ✓ Reduces oblique aberrations
- ✓ Complete personalization (input parameters)
- ✓ Excellent clarity in wraparound frames as well
- ✓ Optimum vision quality also for high prescriptions
- ✓ Maximum Flexibility (inset, length, material, base curve, decentration, thinning prism)
- ✓ Double label

Thank you for your attention

Galileo Optical values your time and business.